

REMARKS

Claims 1-13 are pending in the application. Claims 1-5 and 9-13 have been canceled, claims 14-16 have been added, and claims 6 and 7 have been amended, leaving claims 6-8 and 14-16 for consideration upon entry of the present amendment. Support for the new claims is found throughout the detailed description of the preferred embodiment. Applicant respectfully requests reconsideration in view of the amendment and remarks submitted herewith.

Claims 1-5 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Staples (U.S. 4,013,502). Because claims 1-5 have been canceled, this rejection is moot.

Claims 1-8 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Mauger (U.S. 4,966,663). "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the * * * claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claims 6-8 include the following limitation: "forming a first coating covering a region in which said thick portion of said semiconductor substrate is to be formed; using said first coating as an etching mask to etch said semiconductor substrate so as to reduce thickness of said semiconductor substrate and thereby form said opening forming region." Accordingly, these limitations require formation of an opening in the thin portion. Mauger does not disclose this limitation.

In Mauger, there is no opening, and thus, the substrate cannot be used as a deposition mask. It is clear that Mauger does not presume the use of the silicon substrate as a mask. In addition, Mauger fails to disclose or even suggest formation of an opening in the thin portion after the thin portion is formed, as required by the claims.

In order to form an opening forming region by reducing a thickness of a semiconductor substrate as described in the present invention, a long etching time is required. In the present invention, after an opening forming region is formed through a process that requires a long etching time, an opening is formed through the substrate in a predetermined position on the opening forming region. Thus, after an opening is formed, the opening that requires a high precision in the shape is not exposed to a process for reducing the thickness of the substrate, such as that applied in the opening forming region that requires a long time for etching. Mauger, which fails to disclose formation of an opening, cannot anticipate reducing the thickness of the substrate and then forming an opening, and thus it is clear that claim 6

cannot be anticipated by Mauger. Moreover, formation of a deposition mask through steps as in the present invention cannot be viewed as obvious from Mauger.

Thus, Mauger does not anticipate claim 6. In addition, because claims 7 and 8 include all of the limitations of claim 6, Mauger does not anticipate claims 7 and 8. Accordingly, Applicant respectfully requests that the rejection be withdrawn.

In addition claims 6-8 are also allowable over Staples. Staples discloses a use of silicon wafer as a stencil in a process that uses a molecular beam method. As described in Figure 1 (Figs. 1a-1g) and corresponding description (Col. 3), the manufacturing procedure of the stencil in Staples is (a) forming a groove on the front side of a wafer in a portion that will become an opening of a mask (Fig. 1d) and (b) then etching only a central region of the wafer from the back side of the wafer (Figs. 1e and 1f).

Staples, which discloses a use of a wafer as a stencil (mask), still fails to disclose or even suggest reducing the thickness of a substrate to form an opening forming region and then forming an opening, as described in claim 6 of the present invention. Thus, it is clear that it is not obvious for a person with ordinary skill in the art to first reduce the thickness of a substrate (or form a thick portion at least on a peripheral region of a mask) and then form an opening. In Staples, because the opening is formed first, the opening is exposed to a process for reducing the thickness of the substrate such as in the opening forming region that requires a long etching time, after the opening is formed, which results in an expansion of the size of the opening during the process for reducing the thickness of the substrate. Therefore, with the process of Staples, it is not possible to form an opening with a high precision as in the present invention. In addition, Staples does not recognize the necessity to employ the steps as described in the present invention.


In addition, Applicant has added claims 14-16. None of the citations discloses a thick peripheral portion of a mask, that the thickness is reduced in a region in which an opening is to be formed, that a thick portion is provided in a region between a plurality of opening formation regions, and that the mask is reinforced by the thick portion and the thick peripheral region of the mask. By providing a thick portion in the central region of the mask in addition to the peripheral region, it is possible to maintain the strength of the mask even when a large semiconductor mask substrate is used for a large medium, and, at the same time, to maintain a thin thickness for the opening forming region and a high positional precision of the opening. None of the citations discloses or even suggests such a mask and has no description of necessity of the mask. Accordingly, Applicant respectfully requests that claims 14-16 be allowed.

In view of the foregoing, it is respectfully submitted that the instant application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is cordially requested to telephone the undersigned.

In the event the Commissioner of Patents and Trademarks deems additional fees to be due in connection with this application, Applicant's attorney hereby authorizes that such fee be charged to Deposit Account No. 06-1130.

Respectfully submitted,

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December 18, 2003